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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/602,558	06/23/2000	Toshiyuki Okuyama	5551-2	1024

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EXAMINER

LUGO, DAVID B

ART UNIT PAPER NUMBER

2637

DATE MAILED: 11/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/602,558

Applicant(s)

OKUYAMA ET AL.

Examiner

David B. Lugo

Art Unit

2637

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 July 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) 1,2,5-8,11,12,14 and 15 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 3,4,9 and 10 is/are rejected.
- 7) ☒ Claim(s) 13 and 16 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 June 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Response to Arguments

2. Applicant's arguments, see page 10, paragraph 4, filed 7/15/04, with respect to the objection to the drawings have been fully considered and are persuasive. The rejection of the drawings has been withdrawn.

3. Applicant's arguments, see page 10, paragraph 5 to page 11, paragraph 1, filed 7/15/04, with respect to the objection to the specification including the objection to the abstract have been fully considered and are persuasive. The objection of the specification has been withdrawn.

4. Applicant's arguments with respect to claims 3, 4, 9 and 10 have been considered but are moot in view of the new ground(s) of rejection.

5. With respect to the rejection of claim 3 in view of Paradise and Leonard et al., the rejection has been withdrawn as it is considered to be cumulative with respect to the rejection of claim 3 over applicant's admitted prior art in view of Leonard et al. It is noted that this rejection was not addressed in applicant's response, but in as much as applicant's arguments with respect to the rejection over Paradise in view of Leonard et al. are still relevant to the rejection over applicant's admitted prior art in view of Leonard et al. they will be addressed below. It is also noted that in the previous Office action, this rejection was incorrectly stated as being over Applicant's admitted prior art in view of Paradise instead of in view of Leonard et al., and this mistake is corrected in this Office action.

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6. With respect to Leonard et al., applicant argues that Leonard utilizes only phase information about a complex vector and the combination of Paradise and Leonard is deficient in that it does not teach or suggest the device of claim 3, particularly the frequency error correcting device that counts the number chips of the baseband signals to be inputted, and performs a rotation correction by rotating a phase of the baseband signals by an angle obtained by dividing 2π by a number M. However, the device of Leonard et al. includes a mod 8 counter that supplies a signal to a phase rotator to increment the phase used in the phase rotation in cyclical steps from 0 to M-1 (where M equals 8) in accordance with the modulo operation, and the step is incremented when the number of chip periods (k) supplied from clock f_c , which is at the chip rate, corresponds to the one eighth of a frequency cycle (i.e. $1/8$ of 2π) (see col. 3, lines 19-26). The mod 8 counter of Leonard et al. in combination with the phase rotator is thus considered to comprise a frequency error correcting device that counts the number of chips to be inputted to perform a rotation correction.

7. Applicant further contrasts the disclosure of Leonard et al with the device of claim 3, and states the device of claim 3 is configured to maintain amplitude information. However, this limitation is not recited in the claim, and is therefore not read into the claim.

Claims 3, 4, 9 and 10 stand rejected, as detailed below.

Claim Objections

8. Claims 13 and 16 are objected to because of the following informality:

Claim 13, line 6, "base signal" should be --base band signals--.

Claim Rejections - 35 USC § 103

9. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

10. Claims 3, 4, 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's admission of prior art (APA) in view of Leonard et al. U.S. Patent 5,285,472.

11. Regarding claim 3, Applicant discloses in Fig. 19, a prior art reverse spreading device comprising complex matched filters (131, 132). Conventional matched filters, according to prior art Fig. 13, include a spread code multiplier that multiplies complex baseband signals by spread codes and accumulative adders that produce correlation values by performing accumulative addition of the multiplied value for a symbol period of each of the I or Q components.

12. Applicant's APA does not disclose a frequency error correcting device that counts the number chips of the baseband signals to be inputted, and performs a rotation correction by rotating a phase of the baseband signals by an angle obtained by dividing 2π by a number M.

13. Leonard et al. disclose correction of a frequency offset in a despreading device by rotating the phase of the baseband signal in 45° steps at eight times per cycle via a phase rotator and a modulo 8 counter prior to despreading (see Fig. 3; col. 3, lines 19-26).

14. It would have been obvious to one of ordinary skill in the art to use the frequency correction techniques employed by Leonard et al. in the reverse spreading device disclosed in the Applicant's APA to help eliminate frequency offset (see col. 5, lines 24-30).

15. Regarding claim 4, in column 3, lines 19-24, Leonard et al. state that the phase of the signals are rotated to cancel out the offset frequency component by incrementing the phase in 45° steps (i.e. $2\pi/M$ where $M=8$) at eight times per cycle. Thus, the function of the mod 8 counter is

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equivalent to that performed by the chip number counter and the step number counter, as the mod 8 counter supplies a signal to the phase rotator to increment the phase used in the phase rotation in cyclical steps from 0 to M-1 (where M equals 8) in accordance with the modulo operation, and the step is incremented when the number of chip periods (k) supplied from clock f_c , which is at the chip rate, corresponds to one eighth of a frequency cycle (i.e. $1/8$ of 2π).

Further, one of ordinary skill in the art would recognize that the mod 8 counter may be implemented using separate counters including a counter for counting the number of chips, and a separate counter for performing the modulo operation.

16. Accordingly, it would have been obvious to one of ordinary skill in the art to implement the mod 8 counter of Leonard et al. using a chip number counter and a step number counter, as this is deemed a design consideration that fails to patentably distinguish over the prior art of record.

17. Regarding claim 9, Applicant further discloses in prior art Fig. 19, a peak detecting section 137.

18. Regarding claim 10, Applicant further discloses in prior art Fig. 12, a despreading device included in a channel estimating device along with a rotation correcting circuit for detecting and correcting phase errors.

Allowable Subject Matter

19. Claims 13 and 16 would be allowable if rewritten or amended to overcome the objections set forth in this Office action.

20. The following is a statement of reasons for the indication of allowable subject matter:

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The prior art of record fails to teach a method for measuring a frequency error where a phase rotation is performed, based on a count of the number of chips inputted, by rotating a phase of the complex baseband signal by an angle of $2\pi/M$, and the frequency error is detected based on a reference selected according to which reference rotation angle provides a maximum power value based on complex symbol correlation values as recited in claim 13.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **David B. Lugo** whose telephone number is **(571) 272-3043**.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Jay Patel**, can be reached at **(571) 272-2988**.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks
P.O. Box 1450
Alexandria, VA 22313-1450

or faxed to:

(703) 872-9306

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

dl
11/19/04


KHAI TRAN
PRIMARY EXAMINER